



U.S. AIR FORCE

GLOBAL POSITIONING SYSTEM STATUS

CGSIC
27 April 2011

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GPS: FREE – DEPENDABLE – RELIABLE - ACCURATE

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Overview

- **Who We Are**
- **Constellation Snapshot**
- **Space Segment**
- **Ground Segment**
- **User Segment**



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Who We Are

■ **2 SOPS**

- 127 Personnel

■ **5 Crews conducting GPS operations**

- 7 Military
- 1 Civilian
- Navigation Warfare Officer (NWO) on-call

■ **GPS User Operations Center (GPSOC)**

■ **AF Technical Application Center (AFTAC) Det 46**

■ **19 SOPS reserve squadron partner with 2 SOPS**

- Fully integrated into 2 SOPS mission
- Maintain certified operators in all crew positions
- Modernization efforts (GPS IIF, OCX, and GPS III)



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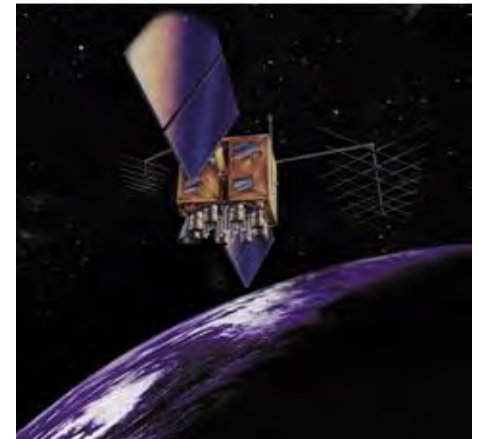
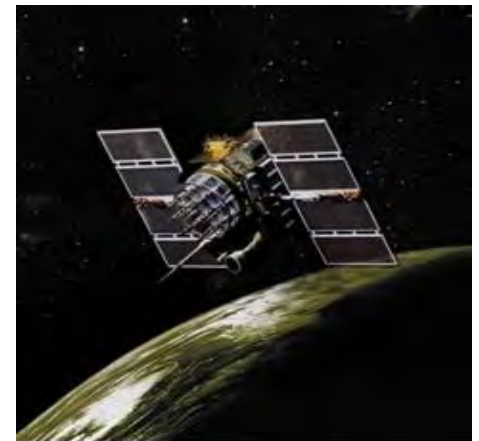


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Constellation Snapshot

31 Operational Satellites (Baseline Constellation: 24)

- **11 Block IIA satellites operational**
- **12 Block IIR satellites operational**
- **7 Block IIR-M satellites operational**
- **1 Block IIF satellite operational**
- **U.S. Government continuously assessing constellation health to determine launch need**
 - **Newest satellites launched**
 - IIR-20 (M)/SVN 49 -- 24 March 2009
 - IIR-21 (M)/SVN 50 -- 17 August 2009
 - IIF-1/SVN 62 -- 27 May 2010
 - **IIF-2 launch scheduled for July 2011**
- **Global GPS civil service performance commitment met continuously since 1993**



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Space Segment

SVN62, SVN49, and SVN 25

- **IIF SV-1 (SVN 62) launched 27 May 2010 under SMC/GP Satellite Control Authority (SCA)**
 - Agreement signed between 50th SW/CC and SMC/GP laying out the roles and responsibilities during the On-Orbit Test (OOT) period
 - SMC/GP retained SCA during OOT
 - 2/19 SOPS operators perform commanding under GPSW direction
 - 50th SW/CC obtained SCA after OOT completion
 - SVN 62 set healthy to users on 26 Aug 10, 2210 hrs Mountain Time
 - L5, L2C, M-Code, and Flex Power
- **SVN 49 remains beneficial for constellation operations but unhealthy to users**
 - Vehicle remains unhealthy due to well-documented multipath anomaly
 - 50 SW and GPSW continue mitigation efforts
 - Used for initial capabilities demonstration: L5, OB 12 , L2C, and Flex Power
- **SVN 25 vehicle disposal**
 - Digital Control Electronics Assembly B-Side failure on 21 Mar 10
 - Launched on 18 March 1992, final disposal on 29 Mar 10
 - Vehicle was just over 18 years old

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Ground Segment

■ Architectural Evolution Plan (AEP)

- Day-to-Day C2 of 32 Satellites
- 4 Dedicated Ground Antennas and AFSCN Capability
- 6 Dedicated and 10 NGA Monitor Stations
- Operating on version 5.6:
 - Brings SAASM capability on-line
 - Adds Nav Warfare Operator (NWO) position
 - Flex Power Testing

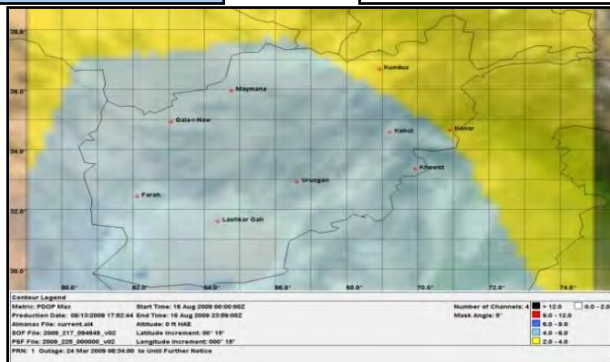
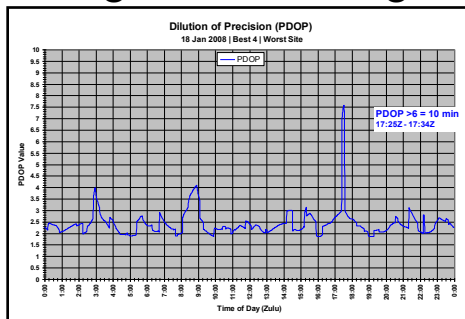
■ Launch, Anomaly and Disposal Operations (LADO)

- Day-to-Day C2 of 3 Residual SVs (SVNs 32, 35, and 37)
- AFSCN capability only
- Leverage for some vehicle emergencies
- Launch prep and initial post launch operations

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- **DoD"s focal point for operational issues concerning military use of GPS**
 - Constellation Ops
 - User Ops
- **DoD"s interface to military and civil community**
 - 24/7 support -- 911 for GPS user emergencies
 - Solving global GPS user's toughest challenges



- **Force location**
- **Navigation**
- **Force employment**
- **Weapon guidance**
- **Satellite positioning**
- **Comm network timing**
- **Plus Many Others**

- **Aviation / Civil Navigation**
- **Space Shuttle**
- **Search and Rescue**
- **Geodetic Measurements**
- **Drilling / Mining / Agriculture**
- **Commercial**
- **Plus Many Others**

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User Segment L2C and L5 Signals

■ Second civil signal “L2C”

- Designed to meet commercial needs
- Provides dual-frequency users with a more robust, coded signal to aid in ionospheric correction
- All 8 IIR (M) satellites and IIF-1 are broadcasting a developmental L2C signal now



■ Third civil signal “L5”

- Designed to meet demanding requirements for transportation safety-of-life and is available to all users
- Uses highly protected Aeronautical Radio Navigation Service (ARNS) band
- SVN 49 and SVN 62 broadcasting a developmental L5

- **Once L2C/L5 are online, USG will not support semi-codeless access to military GPS signals (~2020)**

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User Segment Expandable 24

- **Optimize GPS assets to improve operational effectiveness for global users & terrain challenged environments**
 - Increase the number of vehicles over head for better access/coverage
- **Consistent with the current Standard Positioning Service Performance Standard**
 - Adjust position of satellites in 3 of 6 orbital planes
 - Provides better GLOBAL coverage
 - Coordinated with international community
- **Estimated completion date: Jun/Jul 2011**

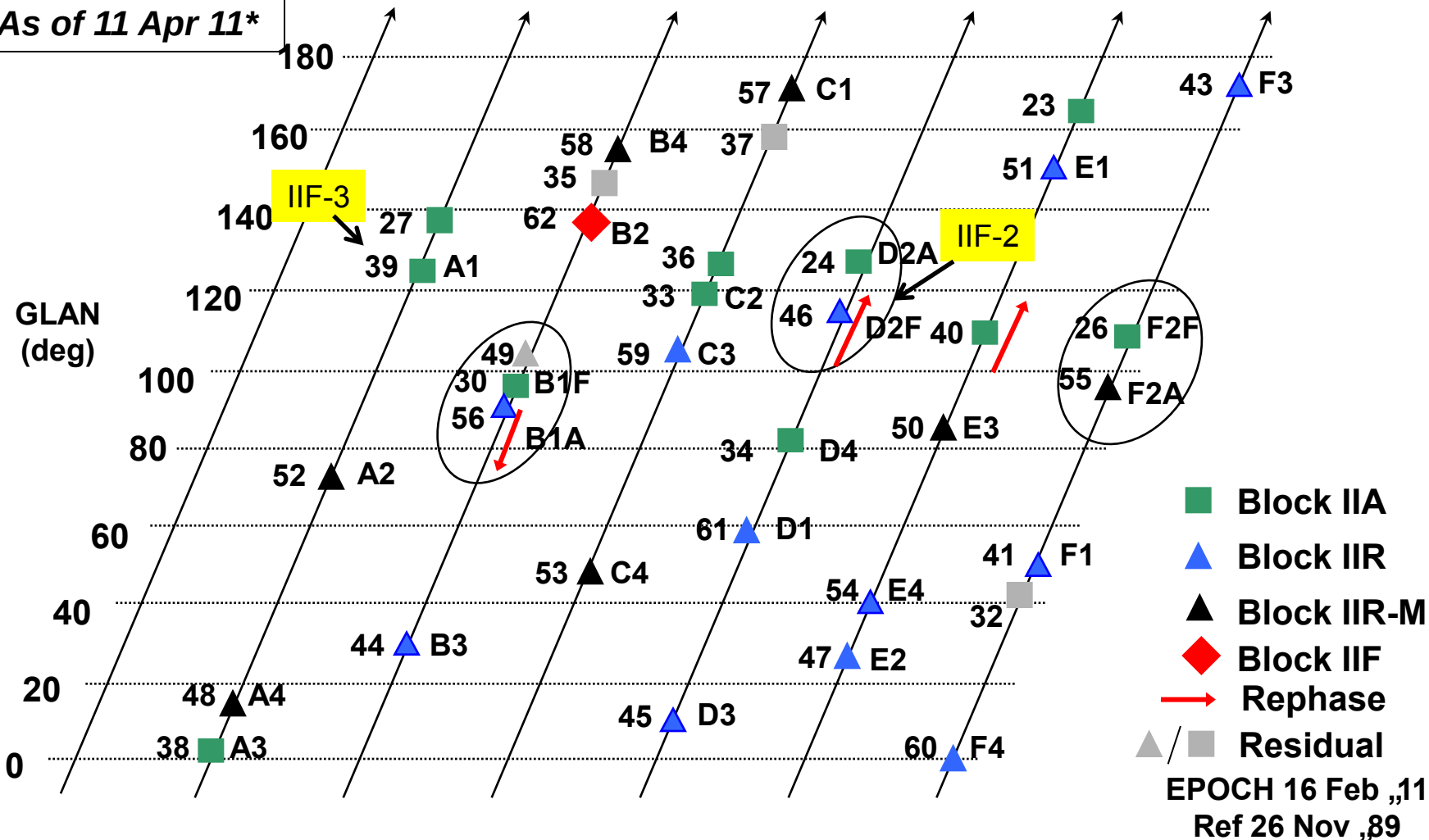




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User Segment Expandable 24 (cont.)

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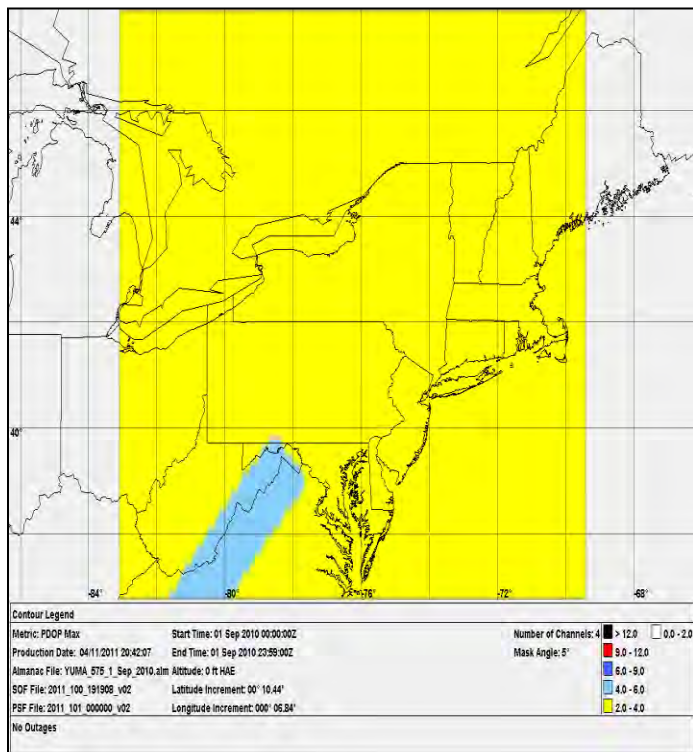


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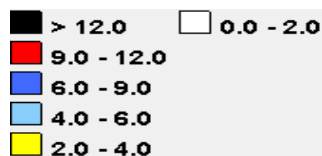
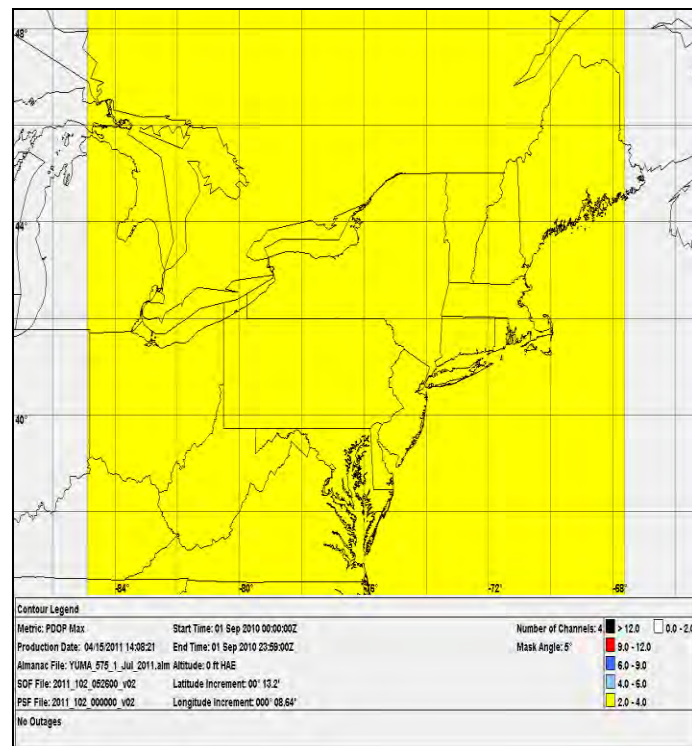
Expandable 24

Benefits on Eastern Seaboard

Current Operations



Expandable 24 Constellation



Lighter Colors = Less Positional Error

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Delivering the Best Space-based PNT

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- ***Sustaining*** capabilities for civil and military users worldwide
 - Maintain ground systems/on-orbit satellites, launch new satellites
 - Fielding GPS enhancements
- ***Modernizing*** constellation with new signals and capabilities
 - New civil and military GPS signals and control capabilities
 - Continuing work with international GNSS community
 - Maintains Backward Compatibility
- ***Managing*** GPS systems and supporting stakeholders

Committed to responsible stewardship of GPS as a global utility

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